Omega-3 ALPHA-Linolenic Fatty Acid in Chia Seeds (Aalvia hispanica L.) and Its Influence on Human Performances

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This project aimed to find out whether chia seeds deserve being called a “super food”. First, we examined if the human digestive system was able to extract from the chia seeds the most beneficial component, namely the unsaturated Alpha-linolenic fatty acid (ALA). Therefore, we simulated the human digestion in vitro and analysed the unsaturated fatty acid (USFA) content within the digested seeds. Our results demonstrate that digestion of chia seeds released USFA. Since 56% of these acids present in chia oil are ALA, we suggest that human digestion allows the release of ALA from the seeds, available to the body for uptake. Secondly, we investigated the effect of different preparation procedures before digestion of the chia seeds on USFA extraction. We demonstrated that cooking, microwaving and freezing decreased the amount of liberated USFA. The most efficient extraction of USFA was obtained when the seeds were not swollen before digestion. Once swollen, seeds which were not pre-treated before digestion showed the highest USFA content. Then, the frozen seeds showed the best results, followed by heated up seeds (no matter if microwaved, cooked or baked). Finally, roasted seeds showed a very low quantity of UFSA and couldn't swell up in water anymore. The reason for this observation is not clear yet. Third, we led a study with 18 students from our school. They consumed the recommended quantity (5g) of chia seeds daily for 6 weeks. We tested then the physical and cognitive capacities of the students at the starting point and after 6 weeks. In conclusion, the regular intake of chia seeds was profitable because it increased the level of essential unsaturated fatty acid, and has positive influence on human performances.